

AMENDMENTS TO THE DRAWINGS

Attached hereto is one (1) replacement sheet of corrected drawings containing FIG. 5A. In FIG. 5A, "YES" has been added around steps S14 and S18 to clarify the invention. These changes do not add new matter. It is respectfully requested that this replacement sheet of FIG. 5A replaces the original FIG. 5A and be made a part of the record of the above-identified application.

REMARKS

Claims 1-20 are pending in the present application. By this reply, claims 12-20 have been added. Claims 1, 3, 5, 7 and 10 are independent claims.

The abstract, specification, claims and drawings have been amended to correct minor informalities and to clarify the invention according to U.S. practice. These modifications do not add new matter to the disclosure.

35 U.S.C. § 102(e) Rejection

Claims 1-6 and 10-11 are rejected under 35 U.S.C. § 102(e) as being anticipated by Ando et al. (U.S. Patent No. 6,741,799). This rejection, insofar as it pertains to the presently pending claims, is respectfully traversed.

The Examiner alleges that Ando et al. anticipates each and every feature recited in independent claims 1, 3, 5 and 10 and cites certain portions of Ando et al. to support his position. However, the cited portions of Ando et al. are directed to disclosing the file identifier descriptor (FID) of the related art mentioned in Applicant's application and does not include any new/additional features provided by the Applicant's claimed invention.

In the alternative, Ando et al. discloses a "permission" 419 stored as part of file management information. Ando et al. on column 21, lines 8-11 defines the permission 419 as "representing information on permission to record, reproduce and delete for each user, mainly used for assuring file security". In

other words, there is no prohibition/permission of renaming and/or moving the file.

Therefore, Ando et al. fails to anticipate, *inter alia*:

reading information on whether or not a file recorded
on the optical disc is prohibited to be renamed

as recited in independent claim 1;

reading information on whether or not a file recorded
on the optical disc is prohibited to be moved;

as recited in independent claim 3; and

each file descriptor has file attribute fields having flags
for restricting file renaming and file moving

as recited in independent claim 10.

Regarding independent claim 5, Applicant's invention is applicable for a disk having a fixed directory, a fixed file name or a fixed location because this is one of the reasons why prohibition information about whether or not a file recorded on the disk is to be copied is needed and provided by Applicant's invention. The problems that the present invention solves are discussed in the background section of the application. Applying the steps as recited in independent claim 5 to the optical disc having a fixed directory, a fixed file name, or a fixed location is not disclosed by Ando et al.

Accordingly, independent claims 1, 3, 5, and 10 and their dependent claims (due to their dependency) are patentable over the applied reference, and reconsideration and withdrawal of the rejection are respectfully requested.

Claims 7-9 have been rejected under 35 U.S.C. § 102(e) as being anticipated by Ichimura et al. (U.S. Patent No. 6,034,832). This rejection, insofar as it pertains to the presently pending claims, is respectfully traversed.

Regarding independent claim 7, Ichimura et al. is directed to controlling a copying operation of data using copy management information. However, Ichimura et al. nowhere discloses controlling at least one of a file renaming and a file moving operation as set forth in claim 7. Thus, Ichimura et al. does not anticipate the invention as recited in independent claim 7 and its dependent claims (due to their dependency). Accordingly, claims 7-9 are patentable over the applied reference, and the rejection must be withdrawn.

New Claims

Claims 12-20 depend from independent claims 1, 3, 7 and 10 and are thus allowable at least for the same reasons that their independent claims are allowable as discussed hereinabove.

CONCLUSION

For the foregoing reasons and in view of the above clarifying amendments, Applicant respectfully requests the Examiner to reconsider and withdraw all of the objections and rejections of record, and earnestly solicits an early issuance of a Notice of Allowance.

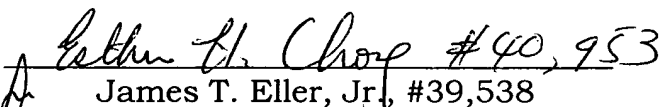
Should there be any outstanding matters which need to be resolved in the present application, the Examiner is respectfully requested to contact Esther H. Chong (Registration No. 40,953) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

Applicant(s) respectfully petitions under the provisions of 37 C.F.R. § 1.136(a) and 1.17 for a one-month extension of time in which to respond to the Examiner's Office Action. The Extension of Time Fee in the amount of \$110.00 is attached hereto.

If necessary, the Commissioner is hereby authorized in this, concurrent, and further replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachments: Replacement Sheet FIG. 5A
Abstract of the Disclosure
Substitute Specification
Mark-Up Copy of Sub. Specification

A FILE MANAGING METHOD FOR A RECORDED DIGITAL STREAM



BACKGROUND OF THE INVENTION

1. Field of the Invention

[001] The present invention relates to a file management method of prohibiting copy of a file and change of a file name or a directory of a file which is recorded in a disk recording medium such as a rewritable digital versatile disk (DVD).

2. Description of the Related Art

[002] FIG. 1 shows partial elements of an optical device such as a video disk recorder which recording and reproducing a signal to/from a disk recording medium such as a rewritable DVD. The device configured as FIG. 1 comprises an optical pickup 2 reading a signal recorded ~~in~~ on a rewritable DVD 1 or writing a data stream processed into a writable signal ~~in~~ on the rewritable DVD 1; a VDR unit 3 processing the read signal to restore to original data and converting an inputted data stream into a signal adequate to be written; and an encoder 4 encoding a received analog signal into a data stream which is sent to the VDR (Video

Disk Recording) unit 3.

~~Disk~~[003] A disk file management method conducted by the optical device connected with a personal computer through a digital interface is explained referring to the accompanying drawings.

[004] Various types of data files are recorded ~~in~~ on the rewritable DVD 1 and the data files consist of data

stream files and information files. The data stream files contain text data or real time audio and video (A/V) data of large size, and the information files contain control information such as navigation data for the A/V or text data contained in the data stream files.

[005] To manage recorded files, the rewritable DVD may adopt a fixed file structure, which is adopted for a DVD ROM disk, composed of a root directory, several title set directories located under the root, and data files having different names and extension located under each title set directory.

[006] FIG. 2 shows an example of such a fixed file structure in which a video title set directory under a root directory has several data files having different extension names.

[007] Under the video title set directory, many files of 'Video_TS.IFO', 'Video_TS.VOB', 'Video_TS.BUP', 'VTS_01_0.IFO', 'VTS_01_1.VOB', 'VTS_01_2.VOB', and 'VTS_01_0.BUP' have been recorded. The file 'Video_TS.IFO' contains video data management information, the file 'Video_TS.VOB' contains menu data of a recorded video object (VOB), the file 'Video_TS.BUP' contains backup data for the video data management information, the file 'VTS_01_0.IFO' contains information on the first video title set, the file 'VTS_01_1.VOB' is the first video object containing A/V data belonging to the first video title set, the file 'VTS_01_2.VOB' is the second video object containing A/V data belonging to the first video title set, and the file 'VTS_01_0.BUP' contains backup information on the first video title set.

[008] In addition, detailed information for each of the above files is written in a file identifier

descriptor (FID) whose fields are shown in FIG. 3A. These fields are 'Descriptor Tag', 'File Version Number', 'File Characteristics', 'Length of File Identifier', 'Information Control Block (ICB)', 'Length of Implementation Use', 'Implementation Use', 'Name of File Identifier', and padding. Among these fields, 'Name of File Identifier' field is used for writing a string indicative of a file name, 'Length of File Identifier' field is used for writing size information of the file name, and 'File Characteristics' field, whose size is 1 byte, is used for writing various attributes of the file. The attributes written in 'File Characteristics' field are shown in FIG. 3B. The first LSB (Least Significant Bit) indicates whether an associated file exists or not, the second LSB indicates whether the file is directory or file, the third indicates deletion of the file, the fourth indicates whether the directory is parent or not, the fifth indicates meta data, and the remaining bits are reserved for future use.

[009] If the first title set recorded ~~in~~ on the rewritable DVD 1 having the above file structure is requested to be reproduced after the rewritable DVD 1 is inserted in the optical disk device of FIG. 1, the VDR unit 3 searches the DVD 1 for video title set directory under the root directory, and tries to read the several files under the video title set directory. To read data files and their management file belonging to the first video title set requested to be reproduced, the VDR unit 3 refers to information written in FID. The VDR unit 3 reads data files sequentially after searching them using navigation information written in the management file.

[010] The disk device of FIG. 1 may be connected to a

personal computer (PC) through a digital interface, so that a user might request a file name of the rewritable DVD 1 to be changed into a desirable name through the PC and the digital interface. In addition, a user might move files under a video title set directory to other directory.

[011] Such changes of file name and directory might be directly conducted on the PC after the rewritable DVD 1 is placed in the PC.

[012] However, the VDR unit 3 searches a rewritable DVD for pre-specified file names under pre-specified directory according to a playback-requested video title set, ~~therefore.~~ Therefore, the VDR unit 3 could not determine which file to read so that it could not reproduce a playback-requested video title set, if the file or directory names were changed or files were moved to other directories.

[013] Besides these problems, there is a problem that video title sets recorded ~~in~~ on a rewritable DVD may be copied onto other storage device through a PC, which would cause to infringe a copyright of the video title sets.

SUMMARY OF THE INVENTION

[014] It is an object of the present invention to provide a file management method for a recorded digital stream which is able to prevent file name and directory of a rewritable disk recording medium from being changed as well as to prevent files recorded ~~in~~ on the rewritable disk recording medium from being copied onto other storage device with a PC.

[015] A file management method for a recorded digital

stream according to an aspect of the present invention writes, in a writable disk, file describing information comprising file attributes for informing whether to prohibit renaming of file, directory change, or file copy, and determines whether to conduct a requested renaming of file, directory change, or file copy based on the written file attributes contained in the file describing information.

[016] These and other objects of the present application will become more readily apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments of the invention, are given by way of illustration only, since various changes and modifications within the spirit and scope of the invention will become apparent to those skilled in the art from this detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[017] The accompanying drawings, which are included to provide a further understanding of the invention, illustrate the preferred embodiments of the invention, and together with the description, serve to explain the principles of the present invention.

[018] In the drawings:

[019] FIG. 1 shows partial elements of an optical device such as a video disk recorder which recording and reproducing a signal to/from a disk recording medium such as a rewritable DVD;

[020] FIG. 2 is an example of a fixed file structure;

[021] FIGS. 3A and 3B show a format of file

identifier descriptor and its attribute field, respectively;

[022] FIG. 4 shows ~~the~~ examples of attribute bit flags according to the present invention; and

[023] FIGS. 5A and 5B are flow diagrams of a file management method for a recorded digital stream according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

EMBODIMENTS

[024] In order that the invention may be fully understood, preferred embodiments thereof will now be described with reference to the accompanying drawings.

[025] The file identifier descriptor written ~~in~~ on a rewritable DVD according to the present invention ~~is~~ has the same structure as the conventional one file identifier descriptor, except for internal attribute bits of its field ~~of~~ 'File Characteristics'. That is, the file identifier descriptor, as shown in FIG. 3A, has fields of 'Descriptor Tag', 'File Version Number', 'File Characteristics', 'Length of File Identifier', 'Information Control Block (ICB)', 'Length of Implementation Use', 'Implementation Use', 'Name of File Identifier', and padding.

[026] The attribute bit flags of the 'File Characteristics' field according to the present invention are shown in FIG. 4. The first LSB ('0' in FIG. 4) indicates whether an associated file exists or not, the second LSB ('1') indicates whether the file is directory or file, the third bit ('2') indicates deletion of the

file, the fourth bit ('3') indicates whether the directory is parent or not, the fifth bit ('4') indicates meta data, the sixth bit ('5') indicates whether a file name is changeable or not, the seventh bit ('6') indicates whether a file is movable or not, and the last bit ('7') indicates whether a file is allowed to be copied or not.

[027] As shown in FIG. 4, the 'File Characteristics' field according to the present invention has additional bit flags of 'No Permit to Change Name', 'No Permit to Move File', and 'No Permit to Copy File' besides the conventional attribute bits of 'Existence', 'Directory', 'Deleted', 'Parent', and 'Meta Data'. ~~The~~ These three 'No Permit' attribute bit flags are used as information to refer whenever a file is requested to rename, move, or copy or in a PC or from a PC to an optical disk device through a connecting digital bus.

[028] The 'No Permit to Change Name' bit flag is used for determining whether to allow to rename an associated file, the 'No Permit to Move File' bit is used for determining whether to allow to change a directory to which an associated file belongs ~~to~~, and the 'No Permit to Copy File' bit is used for determining whether to allow an associated file to be copied.

[029] FIGS. 5A and 5B are flow diagrams of a file management method for a recorded digital stream according to an embodiment of the present invention. The flow diagrams of FIGS. 5A and 5B ~~are~~ can be conducted by an optical disk device configured as FIG. 2.

~~The~~ [030] Referring to FIGs. 5A and 5B, the VDR unit 3 sets ~~a~~ an interlinking operation mode (S10) in which a file operation requested from a PC is acceptable if it is

detected that the disk device has been connected with the PC through a digital interface. In this mode, if the PC requests a list of files under a certain directory recorded ~~in~~ on the rewritable DVD 1 installed in the disk device (S11), the VDR unit 3 reads FIDs associated with files under the directory, and sends file names written in every fields of 'Name of File Identifier' to the PC (S12).

[031] Accordingly, the PC displays the received file names onto its monitor, and a user may enter a command to rename, move, or copy a certain file after he or she looks into the displayed files and their directory. If a user enters such a command, the PC transmits the entered command to the disk device through a digital interface together with file identifying information (S13).

[032]-

Then, the VDR unit 3 of the disk device checks what the received command is. If the received command accompanying the file identifying information is for renaming a file (S14), the VDR unit 3 searches for the associated FID based on the file identifying information and checks the sixth bit 'No Permit to Change Name' written in the 'File Characteristics' field of the associated FID. If the sixth bit is 1 (S15) which means that the change of the filename is not permitted, the VDR unit 3 generates a message notifying that the requested file can not be renamed, and sends it to the PC (S17) through the digital interface. Otherwise, the renaming of the file is permitted and conducted (S16).

[033] If the received command is for moving a file (S18), the VDR unit 3 searches for the associated FID and checks the seventh bit 'No Permit to Move File' written in the 'File Characteristics' field of the associated

FID. If the seventh bit is 1 (S19) which means that file moving is not permitted, the VDR unit 3 generates a message notifying that the requested file can not be moved to ~~ether~~ another directory, and sends it to the PC (S21). Otherwise, the moving of the file to another directory is permitted and conducted (S26).

[034] In addition, if the received command is for ~~moving~~ copying a file (S22), the VDR unit 3 searches for the associated FID and checks the last bit 'No Permit to Copy File' written in the 'File Characteristics' field of the associated FID. If the last bit is 1 (S23) which means that file ~~copy~~ copying is not permitted, the VDR unit 3 generates a message notifying that the requested file can not be copied, and sends it to the PC (S25). Otherwise, the file copying is permitted and conducted (S24).

[035] According to the above-explained operation, file renaming, file moving, or file ~~copy~~ copying is prohibited for files recorded ~~in~~ on a rewritable disk, a user who requested a file operation becomes aware that the file operation requested for the files recorded ~~in-a~~ on the rewritable disk has been prohibited through a corresponding message displayed ~~ente~~ on the monitor.

[036] The digital stream file management method explained ~~so far can basically prevent~~ herein prevents disk reproduction ~~fail~~ failure caused by a file or directory change of files containing the A/V digital data stream as well as copyright infringement caused by copying the digital stream files recorded ~~in~~ on a rewritable disk.

[037] Although the preferred ~~embodiment~~ embodiments of the present invention have been disclosed for

illustrative purposes, those skilled in the art will appreciate that various modifications, additions and substitutions are possible, without departing from the scope and spirit of the invention as recited in the accompanying claims.